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Claims

1. – 40. (canceled)

41. (currently amended) In a computer system, a computer-implemented method of media encoding according to a multi-pass control strategy, the method comprising:

in a first pass, encoding media data;

storing auxiliary information from the encoding in the first pass, wherein the stored auxiliary information is side information to be output in a bitstream and used in decoding; and

in a second pass, encoding the media data, including using the stored auxiliary information to increase speed of the encoding in the second pass.

42. (previously presented) The method of claim 41 wherein the media data are audio data.

43. (previously presented) The method of claim 41 wherein the auxiliary information comprises mask values.

44. The method of claim 41 wherein the auxiliary information comprises tile configurations.

45. (currently amended) The method of claim 41 wherein the auxiliary information comprises multi-channel transforms.

46. (previously presented) The method of claim 41 wherein the encoding in the second pass produces variable bitrate output around a target quality.

47. (previously presented) A computer-readable medium storing computer-executable instructions for causing the computer system to perform the method of claim 41.

48. (currently amended) In a computer system, a computer-implemented method comprising:

in a first pass, computing a first pass signature for each of one or more portions of media data and encoding the one or more portions, wherein the first pass signature for each of the one or more portions comprises a value derived from input of the portion; and

in a second pass,

computing a second pass signature for a given portion of the one or more portions, wherein the second pass signature for the given portion comprises a value derived from input of the given portion;

comparing the second pass signature with the first pass signature for the given portion so as to check that the input for the given portion is consistent between the first pass and the second pass;

if the first pass signature matches the second pass signature, encoding the given portion;

otherwise, performing one or more alternative actions.

49. (previously presented) The method of claim 48 wherein the media data are audio data.

50. (previously presented) The method of claim 48 wherein the portions are chunks.

51. (previously presented) The method of claim 48 wherein the first pass and second pass signatures are based at least in part upon an XOR of input bytes of media data.

52. (previously presented) The method of claim 48 wherein the first and second passes are part of a multi-pass variable bitrate control strategy.

53. (previously presented) The method of claim 48 wherein the one or more alternative actions include stopping the second pass.

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54. (previously presented) The method of claim 48 wherein the one or more alternative actions include notifying the user.

55. (previously presented) The method of claim 48 wherein the one or more alternative actions include encoding the given portion using alternative encoding techniques.

56. (previously presented) A computer-readable medium storing computer-executable instructions for causing the computer system to perform the method of claim 48.

57. (currently amended) In an audio encoder, a computer-implemented method of audio encoding according to a multi-pass variable bitrate control strategy, the method comprising:

in a first pass, encoding a sequence of audio data;

storing auxiliary information from the encoding in the first pass, wherein the stored auxiliary information is side information to be output in a bitstream and used in decoding; and

in a second pass, encoding the sequence of audio data in view of a goal of uniform quality at variable bitrate, wherein a peak bitrate constraint affects quality and bitrate in the second pass, and wherein the stored auxiliary information is used to increase speed of the encoding in the second pass.

58. (previously presented) The method of claim 57 wherein the audio encoder models a decoder buffer to test the peak bitrate constraint.

59. (previously presented) The method of claim 58 wherein the audio encoder reduces a target quality to avoid underflow in the decoder buffer.

60. (previously presented) A computer-readable medium storing computer-executable instructions for causing a computer system programmed thereby to perform the method of claim 57.

61. (currently amended) In a media encoder, a computer-implemented method of media encoding, the method comprising:

selectively enabling or disabling a peak bitrate constraint for a sequence of media data;

in a first pass, encoding the sequence of media data;

storing auxiliary information from the encoding in the first pass, wherein the stored auxiliary information is side information to be output in a bitstream and used in decoding; and

in a second pass, encoding the sequence of media data, wherein the peak bitrate constraint affects quality and bitrate in the second pass if the peak bitrate constraint is enabled for the sequence, and wherein the stored auxiliary information is used to increase speed of the encoding in the second pass.

62. (previously presented) The method of claim 61 wherein the media data are audio data.

63. (previously presented) The method of claim 61 wherein the media encoder models a decoder buffer to test the peak bitrate constraint.

64. (previously presented) The method of claim 63 wherein the media encoder adjusts one or more control parameters to avoid underflow in the decoder buffer.

65. (previously presented) A computer-readable medium storing computer-executable instructions for causing the media encoder to perform the method of claim 61.

66. (currently amended) In a media encoder, a computer-implemented method of media encoding, the method comprising:

in a first pass, encoding media data;

processing results of the encoding in the first pass, wherein the processing includes setting a checkpoint at a defined percentage of a target total bit count for the media data, wherein the checkpoint is defined in terms of cumulative bit count in encoding of the media data; and

in a second pass, encoding media data, wherein the encoding in the second pass includes checking results of the encoding in the second pass as of the checkpoint.

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67. (previously presented) The method of claim 66 wherein the media data are audio data.

68. (previously presented) The method of claim 66 wherein the encoding in the second pass further includes adjusting a target quality level based at least in part upon the results of the encoding in the second pass as of the checkpoint

69. (previously presented) The method of claim 66 further comprising, at the checkpoint, computing a subsequent checkpoint at a multiple of the defined percentage of the target total bit count, wherein the encoding in the second pass further includes checking results of the encoding in the second pass as of the subsequent checkpoint.

70. (previously presented) A computer-readable medium storing computer-executable instructions for causing the media encoder to perform the method of claim 66.

71. (currently amended) In a media encoder, a computer-implemented method of media encoding, the method comprising:
in a first pass, encoding a sequence of media data;
setting a checkpoint for encoding in a second pass, wherein the checkpoint is defined in terms of cumulative bit count in encoding of the media data; and
in the second pass, iteratively:
encoding media data up to the checkpoint,
checking results of encoding in the second pass up to the checkpoint, and
updating the checkpoint for the encoding in the second pass, wherein the second .
pass continues until the sequence of media data is encoded.

72. (previously presented) The method of claim 71 wherein the media data are audio data.

73. (previously presented) The method of claim 71 further comprising:

in the second pass, after the checking, adjusting one or more control parameters if necessary based upon the results of encoding in the second pass up to the checkpoint, thereby improving uniformity of quality for the sequence.

74. (previously presented) The method of claim 73 wherein a first control parameter of the one or more control parameters is a target quality level.

75. (previously presented) In a media encoder, a computer-implemented method of media encoding, the method comprising:

_____in a first pass, encoding a sequence of media data;

_____setting a checkpoint for encoding in a second pass; and

_____in the second pass, iteratively:

_____encoding media data up to the checkpoint,

_____checking results of encoding in the second pass up to the checkpoint, and

_____updating the checkpoint for the encoding in the second pass, wherein the second pass continues until the sequence of media data is encoded, ~~The method of claim 71~~ wherein the checkpoint is set and updated at multiples of a percentage of a target total bit count for the sequence.

76. (previously presented) A computer-readable medium storing computer-executable instructions for causing the media encoder to perform the method of claim 71.

77. – 81. (canceled)

82. (new) The method of claim 66 wherein the checkpoint is further defined in terms of cumulative input encoded, and wherein the encoder reaches the checkpoint when the encoder reaches the cumulative time elapsed or the cumulative input encoded during the second pass.

83. (new) The method of claim 82 wherein the cumulative input encoded is measured by elapsed time or number of chunks of input.

84. (new) The method of claim 71 wherein the checkpoint is further defined in terms of cumulative input encoded, and wherein the encoder reaches the checkpoint when the encoder reaches the cumulative time elapsed or the cumulative input encoded during the second pass.

85. (new) The method of claim 84 wherein the cumulative input encoded is measured by elapsed time or number of chunks of input.

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